CEL-MAR®
Zakład Informatyki i Elektroniki

User manual

ADA-I9140
USB to RS-485 / RS-422 converter

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1. GENERAL INFORMATION

Thank you for your purchase of **CEL-MAR Company** product. This product has been completely tested and is covered by a two year warranty on parts and operation from date of sale.
If any questions or problems arise during installation or use of this product, please do not hesitate to contact Technical Support at +48 41 362-12-46 or e-mail support@cel-mar.pl.

1.1. WARRANTED INFORMATION

The **ADA-I9140** converter is covered by a two year warranty from date of sale. In case of being damaged it will be repair or the damaged component will be replace. The warranty does not cover damage caused from improper use, materials consumption or any unauthorized changes. If the product does not function (is damaged), or not operate in accordance with the instructions, will be repaired.
All warranty and no warranty repairs must be returned with paid transport and insuring to the **CEL-MAR Company.**
CEL-MAR Company under no circumstances won't be responsible for ensuing damage from improper using the product or as a result of random causes: the lightning discharge, the flood, the fire and the like.
CEL-MAR Company is not be held responsible for damages and loss including: loss of profits, loss of data, pecuniary losses ensuing from using or the impossibility of using this product.
In specific cases CEL-MAR Company discontinue all warranties and in particular do not follow the user manual and do not accept terms of warranty by the user.

1.2. GENERAL CONDITIONS FOR SAFE USE

The device should be installed in a safe and stable places (eg, electroinstallation cabinet), the powering cable should be arranged so as not to be exposed to trampling, attaching, or pulling out of the circuit.
Do not put device on the wet surface.
Do not connect devices for nondescript powering sources,
Do not damage or crush powering wires.
Do not make connection with wet hands.
Do not adapt, open or make holes in casings of the device!
Do not immerse device in water or no other liquid.
Do not put the fire opened on device sources: candles, an oil lamps and the like.
Complete disable from the supply network is only after disconnecting the power supply circuit voltage.
Do not carry out the assembly or disassembly of the device if it is enabled. This may result to short circuit and damage the device.

1.3. CE LABEL

CE

The CE symbol on the device CEL-MAR means compatibility with electromagnetic compatibility Electromagnetic Compatibility Directive **EMC 2004/108/WE.** Declaration of Conformity is available by contact with Technical Service (email: support@cel-mar.pl; phone: +48 41 362-12-46).

1.4. ENVIRONMENTAL PRESERVATION

This sign on the device inform about putting expended device with other waste materials. Device should send to the recycling. (In accordance with the act about the Electronic Appliance Expended from day 29 of July 2005)

1.5. SERVICE AND MAINTENANCE

The **ADA-I9140 converter** does not require the servicing and maintenance.
Technical support is available at number +48 41 362-12-46 in 8.00-16.00, from Monday to Friday or e-mail support@cel-mar.pl.

2. PRODUCT INFORMATION

Converter is delivered with: user manual, CD-ROM with software.

2.1. PROPERTIES

- Conversion of USB to RS485/422 standard,
- Compatibility with USB1.1 and USB 2.0 standard,
- Virtual Serial Port,
- Transmitted signals: RX, TX, additionally RTS, CTS or DTR, DSR (version 2-x) configure by SW2 microswitch,
- STANDARD Baud rate (bps): 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600,
- PROFIBUS baud rate (bps): 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps,19200 bps, **93750**(230400) bps, **187500**(460800) bps, **500000**(921600) bps, **1500000**(14400) bps.
- Transparent for all protocols: MODBUS, DNP, PROFIBUS and other,
- Any format of byte defined with the specification of RS232 interface,
- Operate in “Echo” mode on RS485(2W) bus, activated by SW1 microswitch,
- 120ohm Line Termination of RS485/RS422 bus, activated by SW1 microswitch ,
- Power supply from the USB port,
- 2,7kV= optoisolation in signal channel between USB and RS485/422 interface,
- 1kV= or 3kV= galvanic isolation in power supply channel between USB and RS485/RS422,
- RS-485/RS-422 interface connection via screw terminal block,
- USB interface connection via cable with USB-type A connector,
- Casing dimensions (W x D x H) 91mm x 21mm x 57mm,

2.2. DESCRIPTION

ADA-I9140 converts USB to RS-485/RS-422 standard without interference of data format and it is automatically detect by PC system after connecting to USB network (Plug&Play device). Converter transmits **RX**,**TX signals and two additional RTS, CTS or DTR, DSR set by SW2 microswitch.**
For communication with other devices ADA-I9140 uses data transmission line like:

- **RX+,RX-,TX+/DATA+,TX-/DATA-** (RS-485/422),
- **CTS+/DSR+,CTS-/DSR-,RTS+/DTR+,RTS-/DTR-** (RS-422)

There is also the possibilities of looping the **DTR with DSR signal or RTS with CTS signals**.
This converter doesn't required external power supply (it is powered from USB bus) and it uses asynchronous baud rate up to 921,3 kbps (drivers for STANDARD baud rate) / 1500000 bps (drivers for PROFIBUS baud rate). The converter has implemented overvoltage protection RS485/RS422 interface, 2,7kV= optoisolation in signal channel between USB and RS-485/422 interface and 1kV= or 3kV= galvanic isolation. USB cable with A-type plug enables simple connection to a computer and on other side simple connection the RS485/422 Bus provide plug-in screw terminal block.
Together with the ADA-I9140 we provide the drivers, which after installation, create in operating system additional COM port on the next free number e.g. COM3. It can be use as standard COM port but it isn't hardware port but virtual, create in Windows system. This is the reason why some applications running in DOS and use this port, can operate improperly.

3. CONFIGURATION

For configuration ADA-I9140 are used two dipswitches SW1 and SW2.

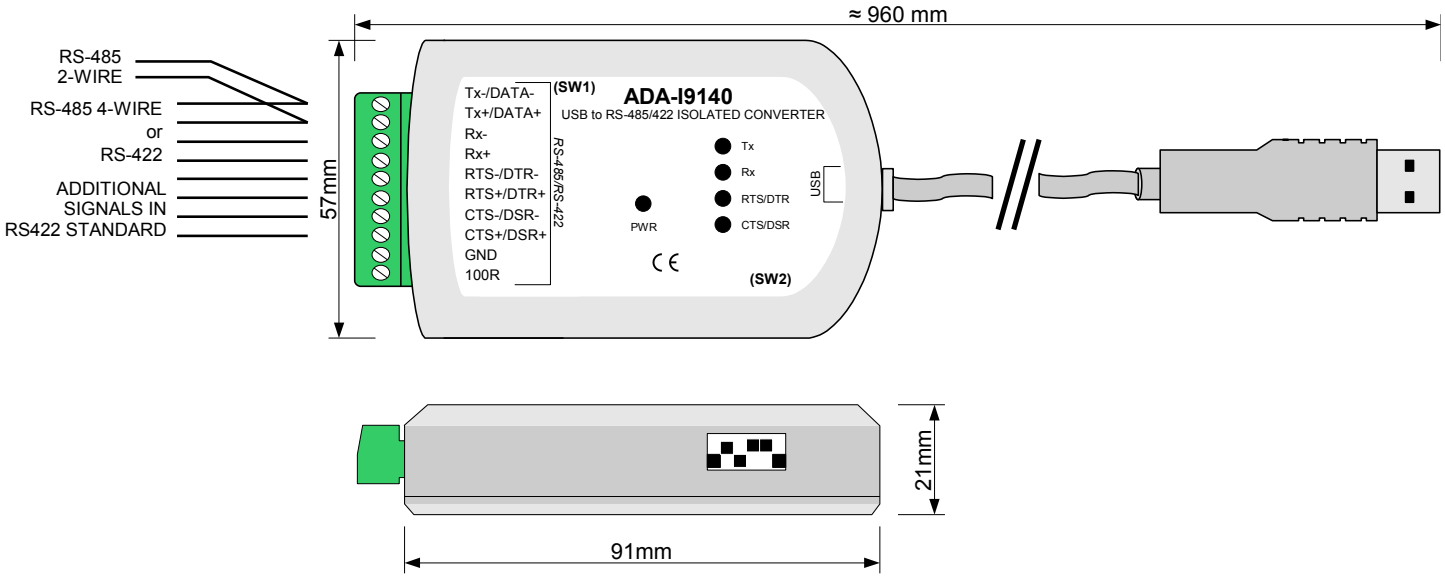


Fig. 1. ADA-I9140 view

3.1. ADDITIONAL SIGNAL CONFIGURATION

For configuration of additional signals is used 6-position dipswitch SW2. A table below shows typical configuration of additional signals RTS, CTS, DTR, DSR. Other configuration possibilities should be agreed with Technical Support – +48 41 362-12-46.
The 6-position dipswitch SW2 is located on one side of the converter.

Table 1. Setting of SW2 dipswitch for 2-x version of ADA-I9140

Function	*SW2-1 DTR-DSR*	*SW2-2 RTS-CTS*	*SW2-3 DTR*	*SW2-4 DSR*	*SW2-5 RTS*	*SW2-6 CTS*
Tx, Rx signals conversion (default setting)	OFF	OFF	OFF	OFF	OFF	OFF
Tx, Rx, RTS, CTS signals conversion	OFF	OFF	OFF	OFF	ON	ON
Tx, Rx, DTR, DSR signals conversion	OFF	OFF	ON	ON	OFF	OFF
Tx, Rx, RTS, CTS signals conversion, DTR looped with DSR	ON	OFF	OFF	OFF	ON	ON
Tx, Rx, DTR, DSR signals conversion, RTS looped with CTS	OFF	ON	ON	ON	OFF	OFF
Tx, Rx signals conversion, RTS looped with CTS and DTR looped with DSR	ON	ON	OFF	OFF	OFF	OFF

Table 2. Setting of SW2 dipswitch for 1-x version of ADA-I9140

Function	*SW2-1 DTR-DSR*	*SW2-2 RTS-CTS*	*SW2-3 DTR*	*SW2-4 DSR*	*SW2-5 RTS*	*SW2-6 CTS*
Tx, Rx signals conversion (default setting)	OFF	OFF	OFF	OFF	OFF	OFF
Tx, Rx signals conversion, RTS looped with CTS and DTR looped with DSR	ON	ON	OFF	OFF	OFF	OFF

3.2. "ECHO" MODE CONFIGURATION AND RS-485/RS-422 BUS TERMINATION

The SW1 dipswitch is used for configuration of ECHO mode and for connection of RS-485/RS-422 terminating resistors. A table below shows typical configuration and other configuration possibilities should be agreed with Technical Support – +48 41 362-12-46.
The 4-position dipswitch SW1 is located on one side of the converter.

Table 3. SW1 setting

Position	*Function*	*Default Setting*
S1-1	ON – enable "ECHO" mode (RS485 2W) OFF – disable "ECHO" mode (RS485 2W)	ON
S1-2	ON - enable RS422 mode OFF - enable RS485 mode The setting available from n/s : I91404802502514	OFF
S1-3	ON - connection of Line Termination (terminator) 120Ω to terminals Rx+, Rx- OFF - disconnection of Line Termination (terminator) 120Ω to terminals Rx+, Rx-	OFF
S1-4	ON - connection of Line Termination 120Ω to terminals Tx+/DATA+/(A), Tx-/DATA-/(B). OFF - disconnection of Line Termination 120Ω to terminals Tx+/DATA+/(A), Tx-/DATA-/(B).	OFF

4. INSTALLATION

This chapter will show how to connect ADA-I9140 to RS-485/RS-422 bus.
To reduce disturbance from environment, it is recommended to:
– use multipair type shielded cables, which shield can be connected to the earthing on one end of the cable,
– lay signal cables at a distance of not less than 25 cm away from power cables,

The GND and 100R terminals are used for connection of RS485/RS422 the grounds to compensate the ground potential of devices operating on RS485/RS422 bus. This connection should be done individually for each systems if standard wiring of RS485/RS422 bus not provide correct transmission.

4.1. CONNECTION TO RS485/RS422 BUS

RS485/RS422 interface of ADA-I9140 converter is available on screw terminal block described as: Tx+/DATA+, Tx-/DATA-, Rx+, Rx-, RTS+/DTR+, RTS-/DTR-.
ADA-I9140 can operate on RS422 bus or RS485 bus - both buses need suitable wiring.

4.1.1. CONNECTION TO RS422 OR RS485 (4-WIRE) BUS

Examples of connection ADA-I9140 to RS422 4-wire bus or RS485(4W) in point-to-point and multi-point topology are shown below.

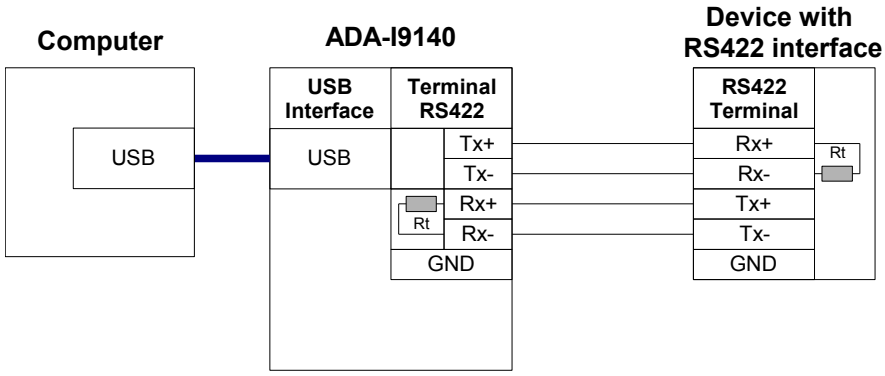


Fig 2. Example of connection in Point-to-Point topology; Tx, Rx signals

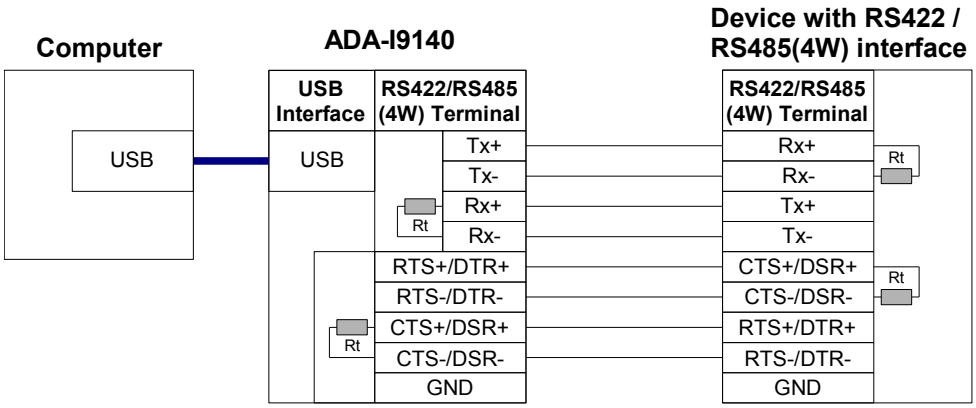


Fig 3. Example of connection in Point-to-Point topology; Tx, Rx, RTS/DTR, CTS/DSR signals

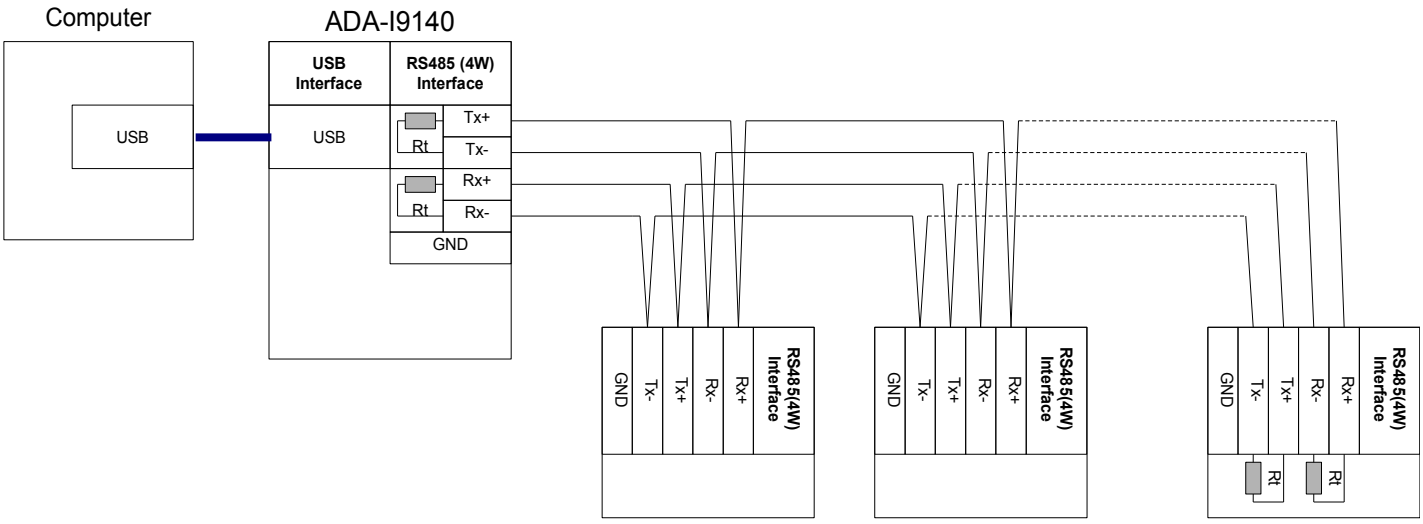


Fig 4. Example of connection RS485(4W) interface devices

4.1.2. CONNECTION TO RS485 2 WIRE BUS

Most of the devices with RS485 interface for data transmission use 2-wire RS485 bus. Example connection are shown below.

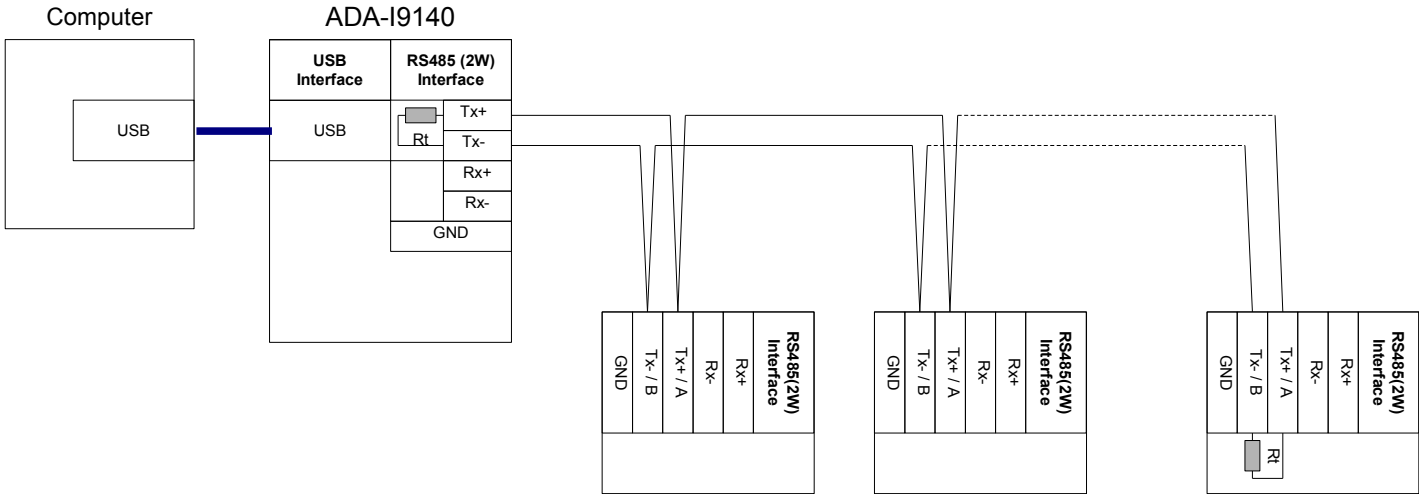


Fig 5. Example of connection RS485(2W) interface devices

4.2. LINE TERMINATION

The application of Line Termination (terminator) Rt = 120 ohms will reduce electrical reflection in data line at high baud rate. It is not needed below 9600Bd. The Line Termination resistor should be used if the distance is over 1000m @ 9600Bd or 700m @ 19200Bd transmission, the resistor can be necessary if there are problems with the transmission correctness. The terminators/resistors are connected to RS485/RS422 bus by the use of SW1 dipswitch. Example connection of Rt are shown on d Fig. 2, 3, 4, 5. Resistor Rt = 120 Ω .

4.3. CONNECTION TO USB COMPUTER PORT

ADA-I9140 connection to computer should be done by use USB cable with A type connector.

4.4. POWER SUPPLY

The converter is powered from USB port of PC. After connection to USB port, the green LED PWR should be light. If doesn't check:
- the computer is running,
- the connection of converter cable to the computer,
- hibernation mode of computer

5. DRIVERS INSTALLATION IN SYSTEM WINDOWS

ADA-I9140 is delivered with the driver package Installer for Windows systems on CD-ROM.
For installation follow the steps below:

a/ insert the CD-ROM to optical driver of the computer,

b/ the installation wizard will run automatically, if not double click ***ADAUSBDRV.exe***.

c/ following the steps of installation wizard, will be installed the Drivers and Uninstaller for the Windows systems 98, ME, 2000, XP, 2003, Vista, Win7, 2008,

d/ connect the convert to USB port of computer and follow the steps of installation wizard.

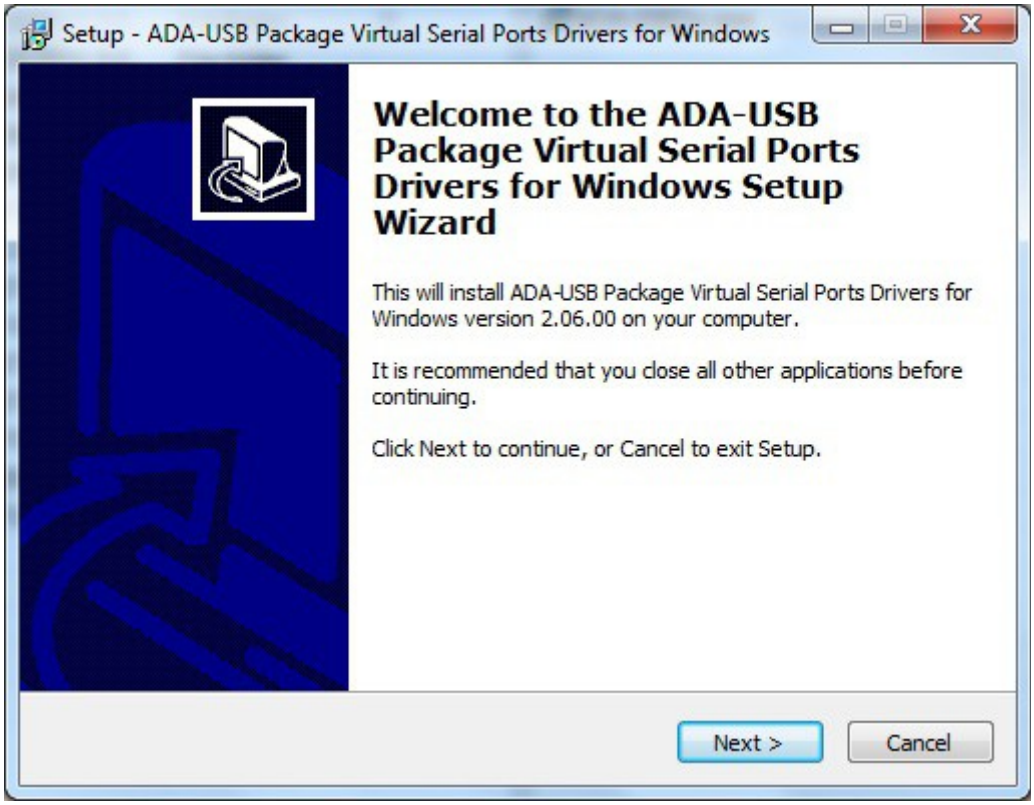
5.1. EXAMPLE OF DRIVER INSTALLATION IN WINDOWS 7 SYSTEM

ADA-I9140 is delivered with the drivers for Windows system 98/ME/2000/XP/Vista/7/2008 and the baud rates:

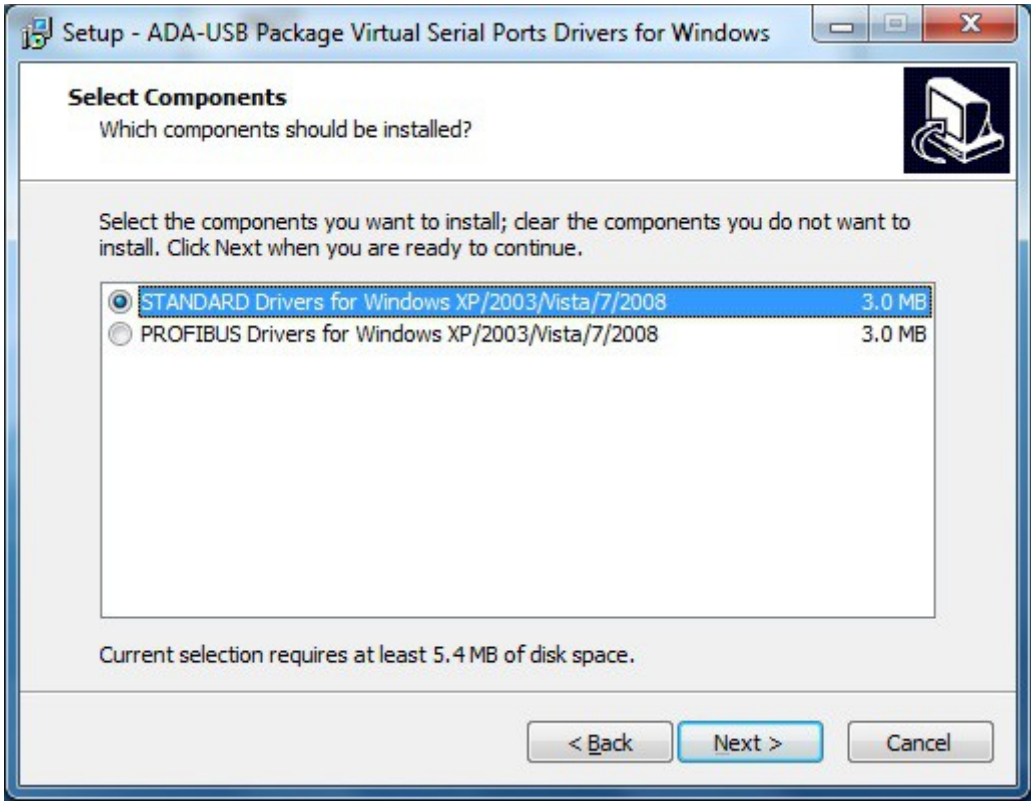
a/ Standard

b/ Profibus

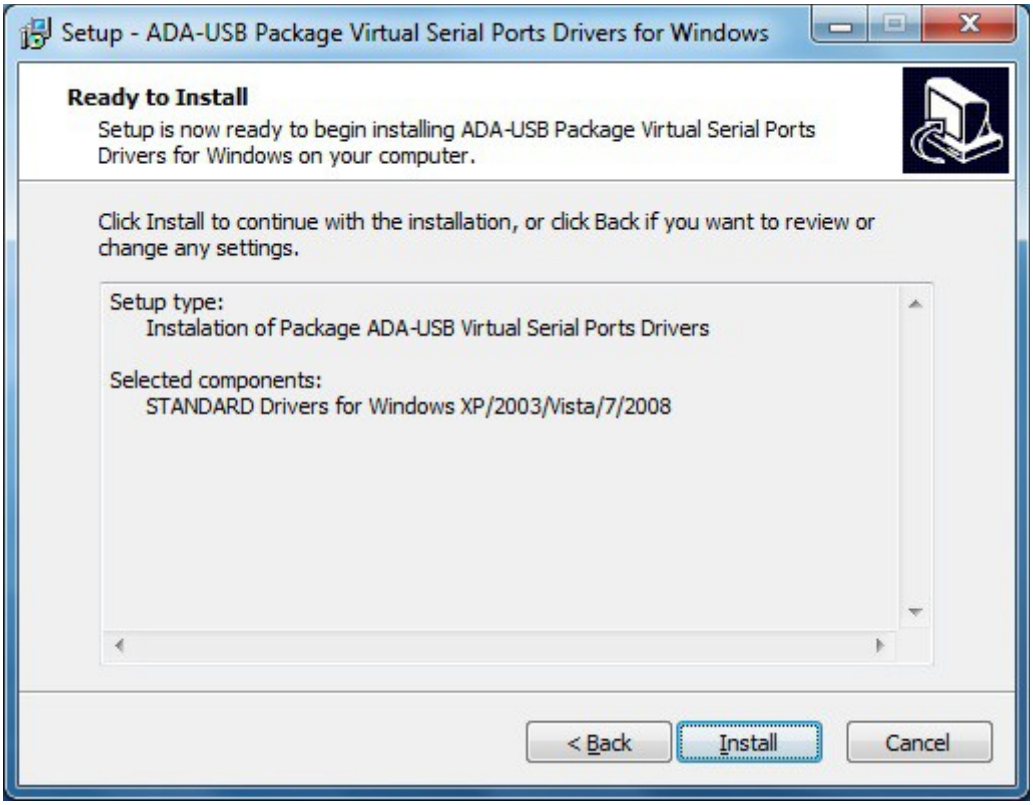
Driver installation have to be done from the account with Administrator permissions. For the drivers installation follow the steps bellow:
a/ insert the CD-ROM to optical driver of computer,
b/ the installation wizard will run automatically, if not double click ***ADAUSBDRV.exe*** form the CD-ROM.
After running the installer, the wizard installation window will appear.


Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Welcome to the ADA-USB Package Virtual Serial Ports Drivers for Windows Setup Wizard
This will install ADA-USB Package Virtual Serial Ports Drivers for Windows version 2.06.00 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

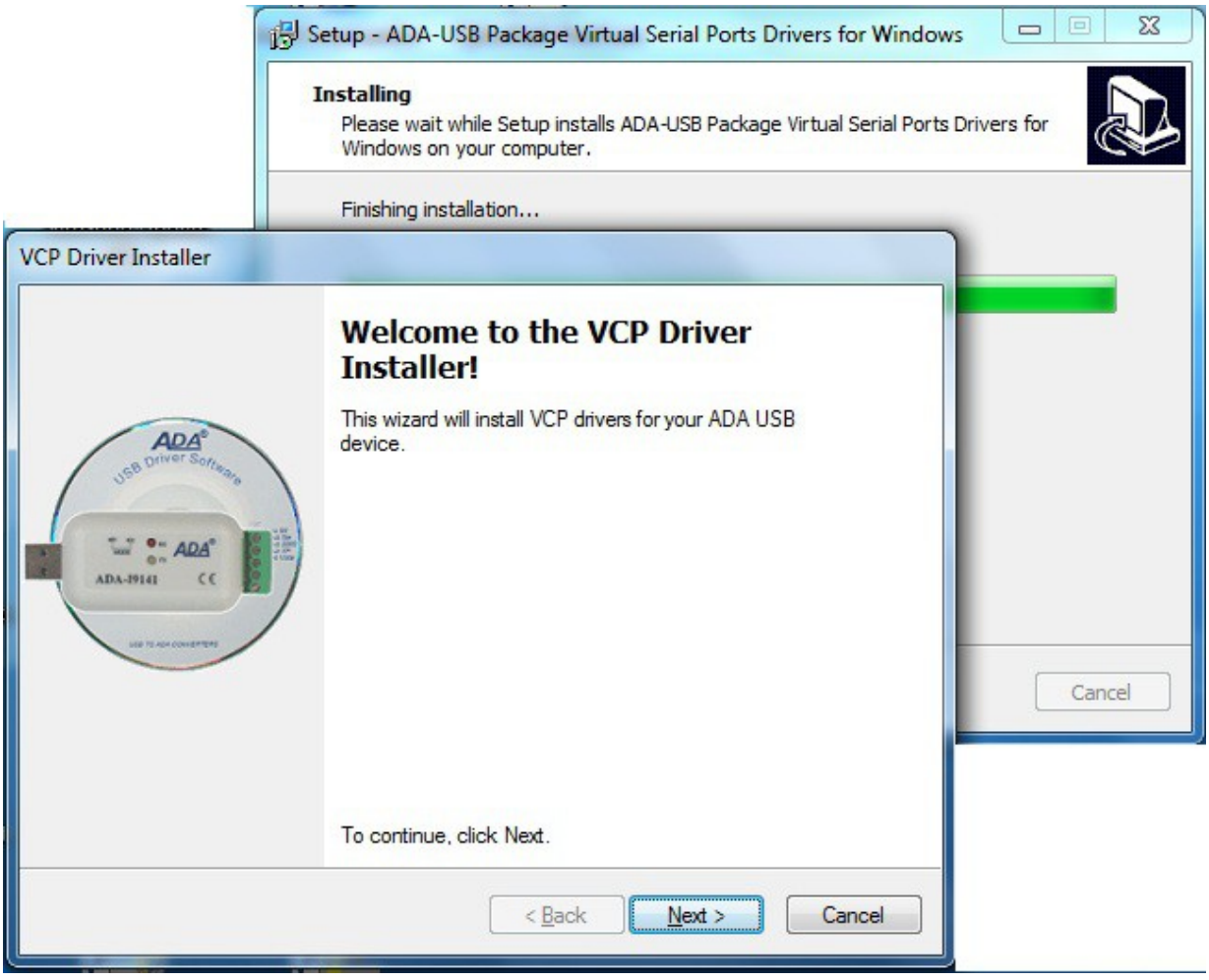
Press [Next]


Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Select Components
Which components should be installed?
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.
STANDARD Drivers for Windows XP/2003/Vista/7/2008 3.0 MB
PROFIBUS Drivers for Windows XP/2003/Vista/7/2008 3.0 MB
Current selection requires at least 5.4 MB of disk space.
< Back
Next >
Cancel

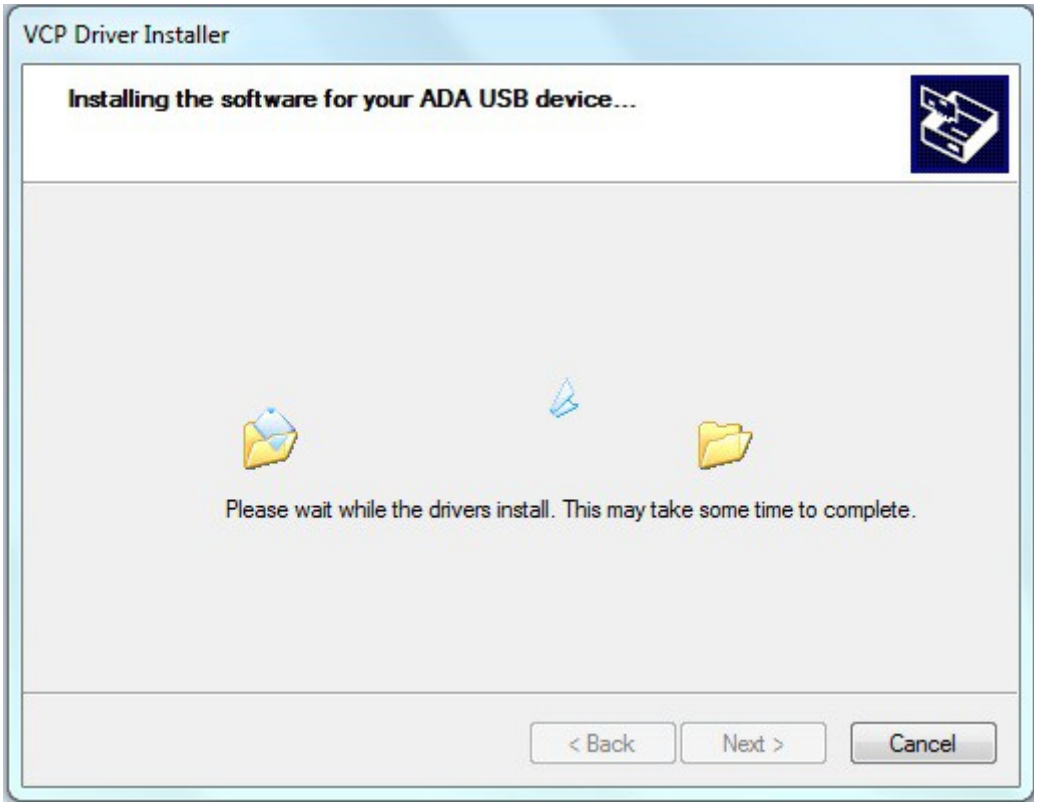
Select STANDARD Drivers and press [Next]

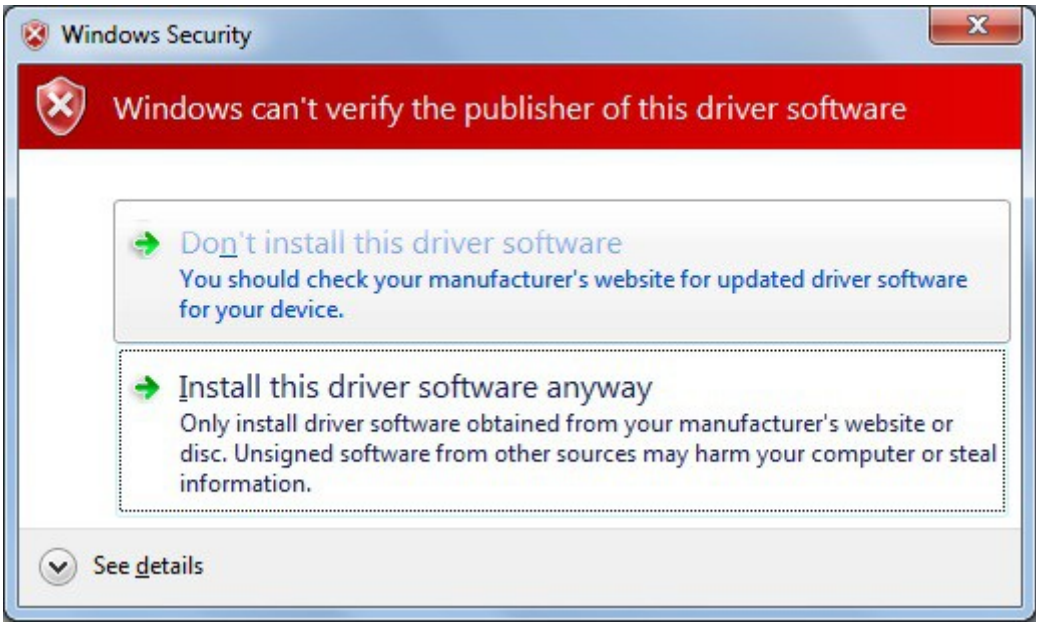

Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Ready to Install
Setup is now ready to begin installing ADA-USB Package Virtual Serial Ports Drivers for Windows on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Setup type:
Instalation of Package ADA-USB Virtual Serial Ports Drivers
Selected components:
STANDARD Drivers for Windows XP/2003/Vista/7/2008
< Back
Install
Cancel

Press [Install]

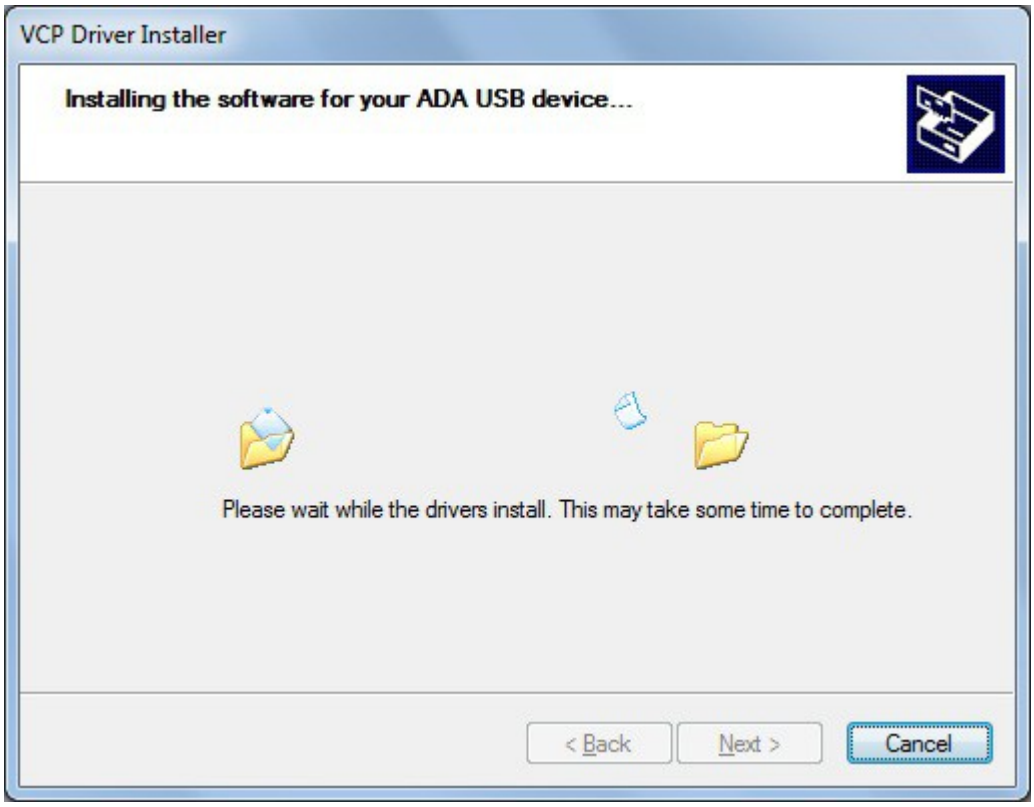

Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Installing
Please wait while Setup installs ADA-USB Package Virtual Serial Ports Drivers for Windows on your computer.
Finishing installation...
Cancel
VCP Driver Installer
Welcome to the VCP Driver Installer!
This wizard will install VCP drivers for your ADA USB device.
To continue, click Next.
< Back
Next >
Cancel

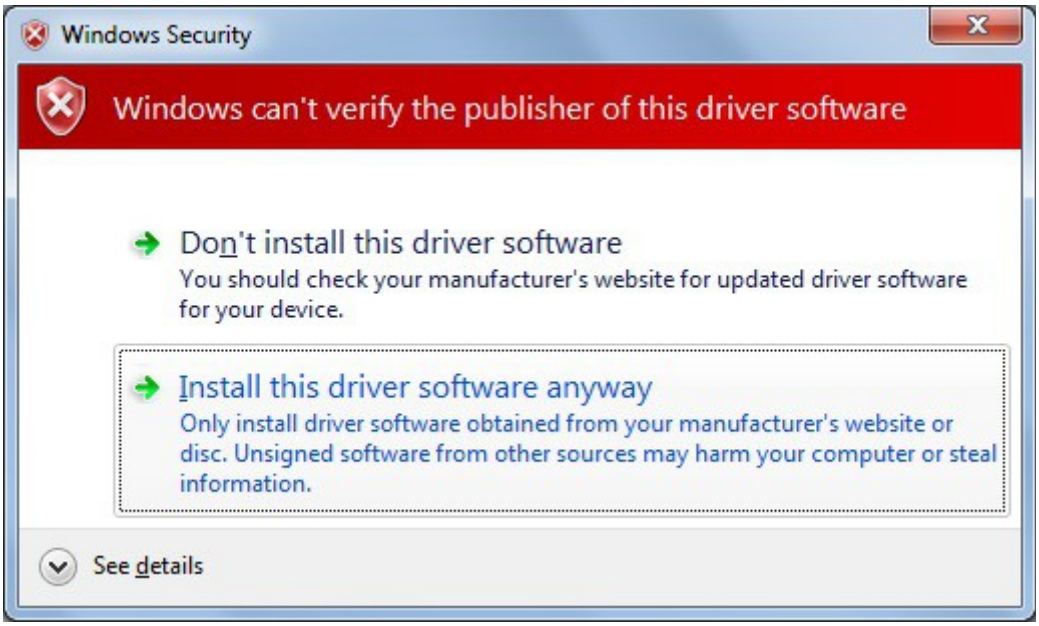
Press [Next], will be installed Drivers for USB Bus.


VCP Driver Installer
Installing the software for your ADA USB device...
Please wait while the drivers install. This may take some time to complete.
< Back
Next >
Cancel


Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

Press [Install this driver software anyway]. Installation of drivers for USB Bus will start.

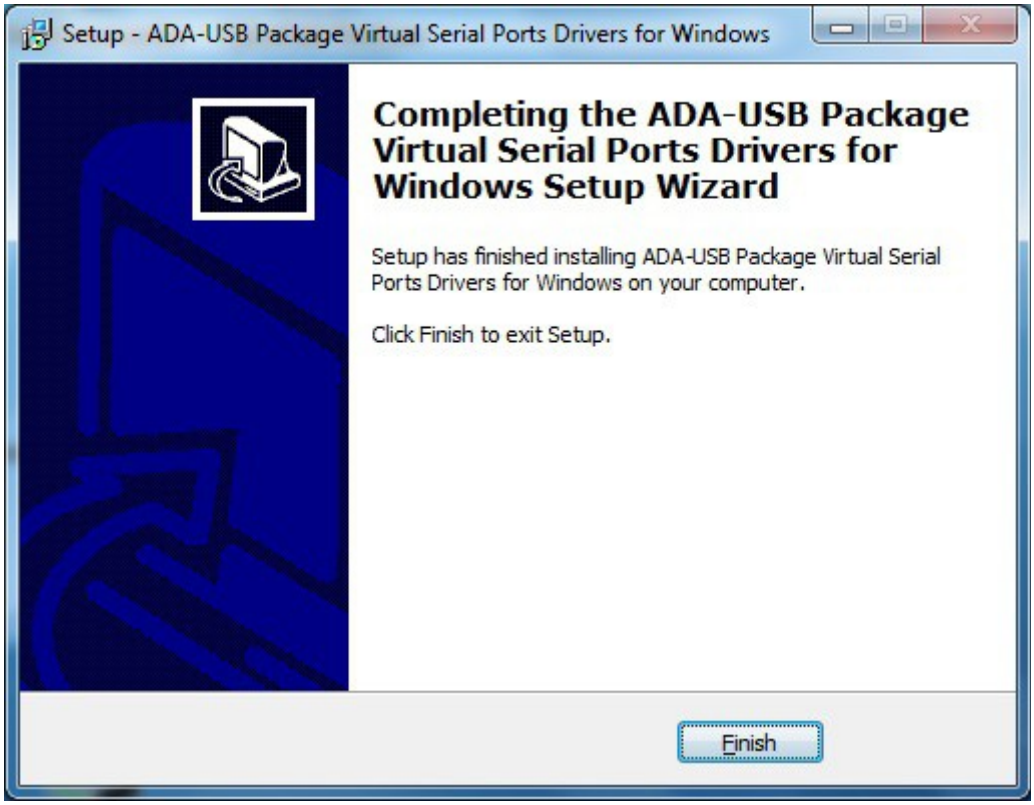

VCP Driver Installer
Installing the software for your ADA USB device...
Please wait while the drivers install. This may take some time to complete.
< Back
Next >
Cancel


Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

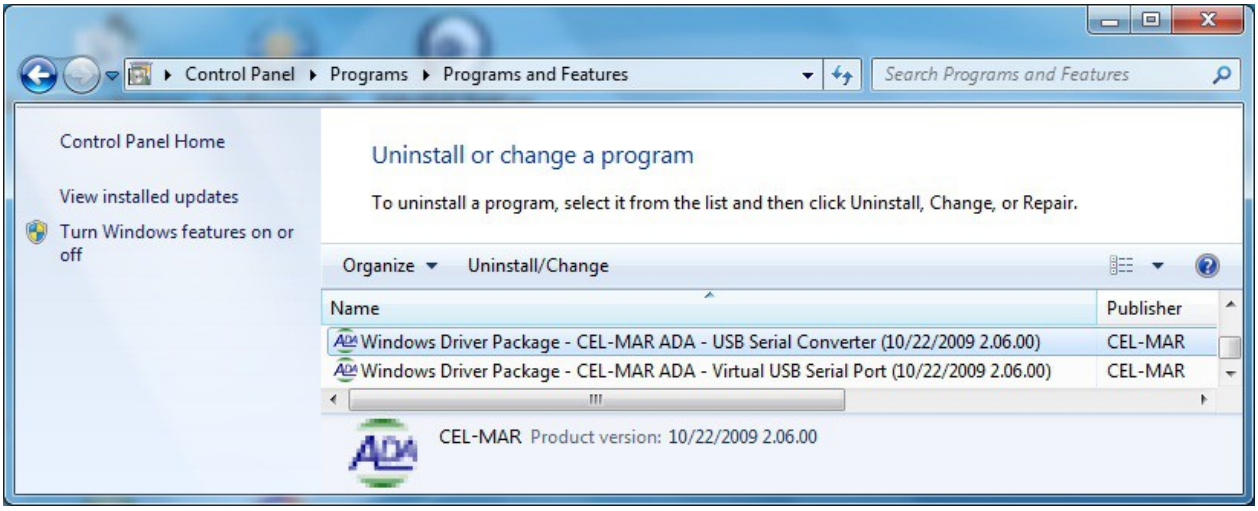
Press [Install this driver software anyway]. Installation of drivers for Virtual Port will start.

VCP Driver Installer
Congratulations! You are finished installing your ADA device.
The drivers were successfully installed on this computer.
You can now connect your device to this computer. If your device came with instructions, please read them first.
Driver Name
Status
CEL-MAR ADA - USB Serial Converter (1...
Ready to use
CEL-MAR ADA - Virtual USB Serial Port (...
Ready to use
< Back
Finish
Cancel

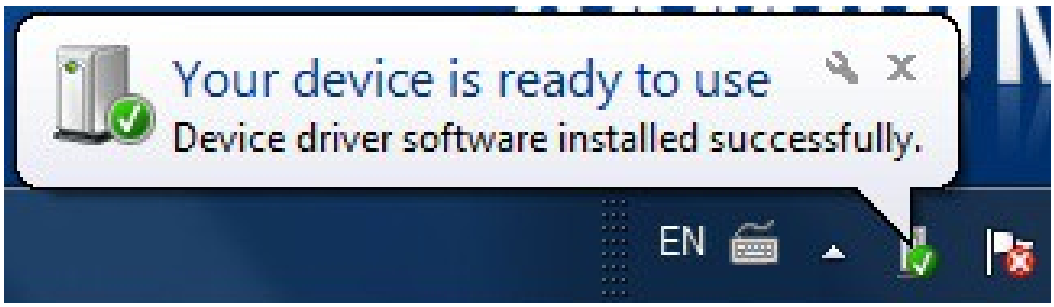
Press [Finish]


Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Completing the ADA-USB Package Virtual Serial Ports Drivers for Windows Setup Wizard
Setup has finished installing ADA-USB Package Virtual Serial Ports Drivers for Windows on your computer.
Click Finish to exit Setup.
Finish

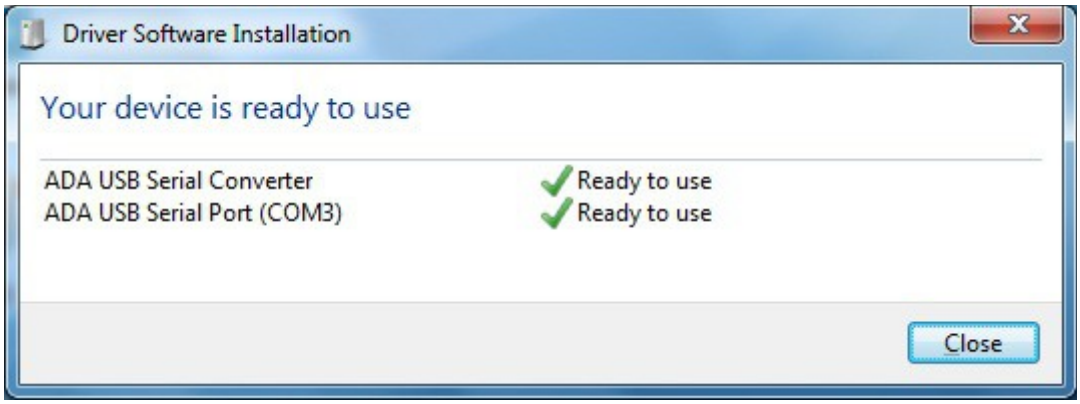
Press [Finish].
The driver for ADA-I9140 have been installed. This can be checked in “Uninstall or change a program“.


Control Panel ▸ Programs ▸ Programs and Features
Search Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall/Change
Name
Publisher
Windows Driver Package - CEL-MAR ADA - USB Serial Converter (10/22/2009 2.06.00)
CEL-MAR
Windows Driver Package - CEL-MAR ADA - Virtual USB Serial Port (10/22/2009 2.06.00)
CEL-MAR
CEL-MAR Product version: 10/22/2009 2.06.00

Now connect ADA-I9140 to computer port.



After connection will appear the Tool tip with [Your device is ready to use]. To see the details press the Tooltip, and will appear information window where is shown which COM port was assigned to converter.



After this installation, RS485/422 port of ADA-I9140 converter is available in the system as normal COM port. It should be remembered about specified baud rate for communication.

If during installation was selected driver for Standard baud rates, it is possible to use:
300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, 230400 bps, 460800 bps, 921600 bps.

If during installation was selected driver for Profibus baud rates, it is possible to use:
300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, **9600** bps,**19200** bps, **93750** bps (if select 230400 bps), **187500** bps (if select 460800bps), **500000** bps (if select 921600 bps), **1500000** bps (if select 14400 bps).

6. DRIVER UNINSTALLATION

6.1. DRIVER UNINSTALLATION IN WINDOWS 98/ME SYSTEMS

In this system driver uninstallation have to be done according follow steps:

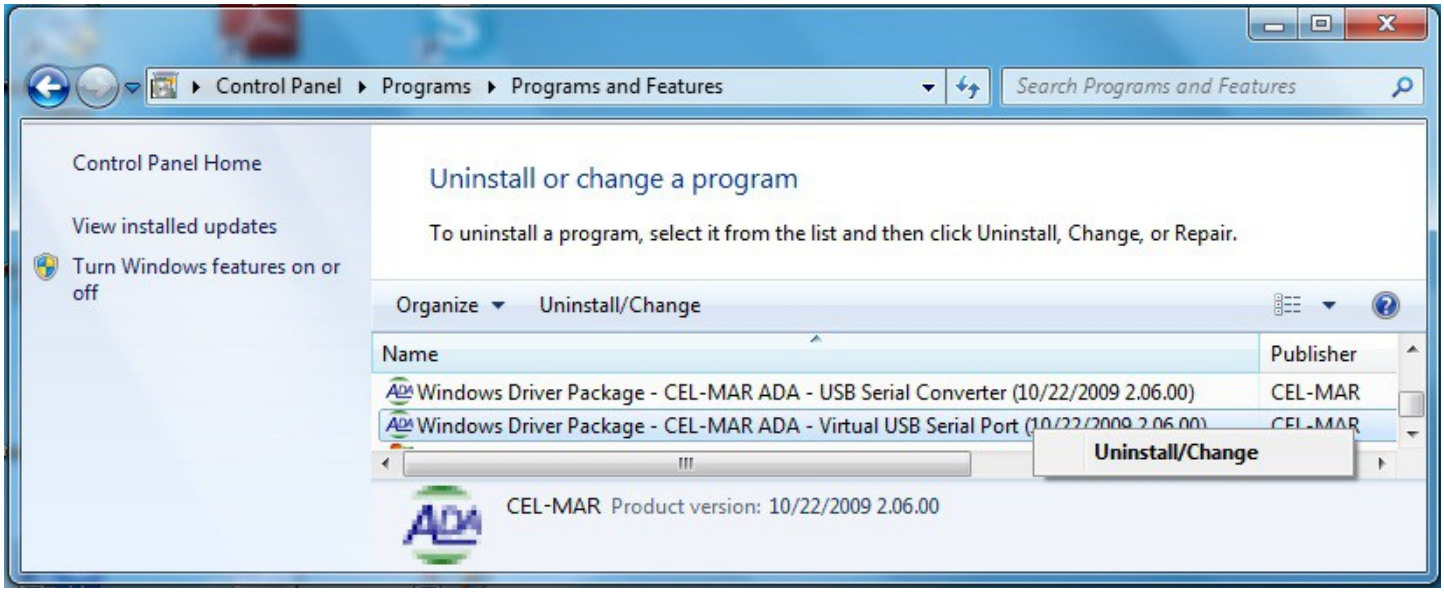
a/ disconnect converter from computer,
b/ select menu ***Start > Setting > Control Panel > Add > Remove Programs,***
c/ select from the list ***"ADA USB Serial Converter Driver"*** and press **[Change / Remove]**,
e/ reboot the computer.

6.2. DRIVER UNINSTALLATION IN WINDOWS 2000/XP/2003/VISTA/7/2008 SYSTEMS

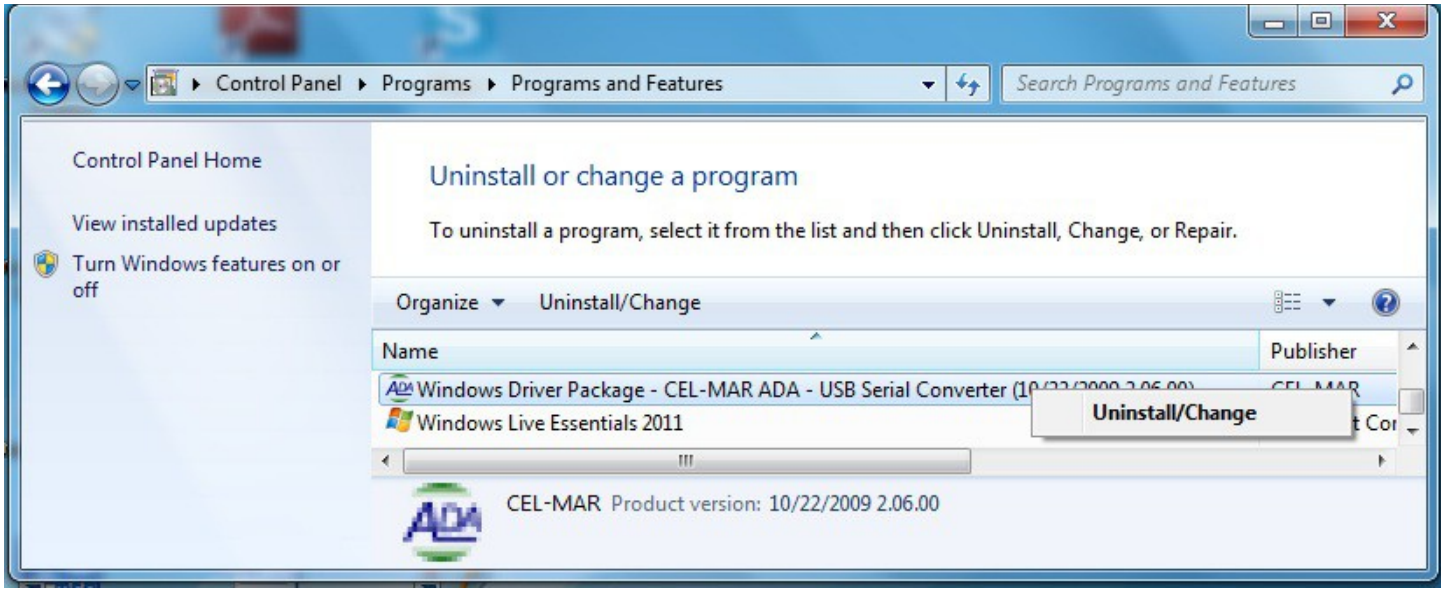
In this system driver uninstallation have to be done according follow steps:
a/ disconnect converter from computer,
b/ login as the ***Administrator,***
c/ select menu ***Start > Setting > Control Panel > Add > Remove Programs,***
d/ select from the list ***Windows Driver Package – CEL-MAR ADA – Virtual USB Serial Port,***
e/ press [Change / Remove], Virtual USB Serial Port driver will be uninstalled,
f/ select from the list ***Windows Driver Package – CEL-MAR ADA – USB Serial Converter,***
g/ press [Change / Remove], driver converter of USB Bus will be uninstalled,
h/ after uninstallation reboot the computer.

6.2.1. EXAMPLE DRIVER UNINSTALLATION IN WINDOWS 7 SYSTEMS

Windows 7 system driver uninstallation have to be done according follow steps:
a/ disconnect converter from computer,
b/ login the ***Administrator account ,***
c/ select menu ***Start > Control Panel > Programs > Uninstall,***
d/ select from ***Windows Driver Package – CEL-MAR ADA – Virtual USB Serial Port,***


Control Panel ▸ Programs ▸ Programs and Features
Search Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall/Change
Name
Publisher
Windows Driver Package - CEL-MAR ADA - USB Serial Converter (10/22/2009 2.06.00)
CEL-MAR
Windows Driver Package - CEL-MAR ADA - Virtual USB Serial Port
Uninstall/Change
CEL-MAR Product version: 10/22/2009 2.06.00

e/ press ***[Uninstall/Change]***, Virtual USB Serial Port driver will be uninstalled
f/ select from the list ***Windows Driver Package – CEL-MAR ADA – USB Serial Converter***


Control Panel ▸ Programs ▸ Programs and Features
Search Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall/Change
Name
Publisher
Windows Driver Package - CEL-MAR ADA - USB Serial Converter
Windows Live Essentials 2011
Uninstall/Change
CEL-MAR Product version: 10/22/2009 2.06.00

g/ press ***[Uninstall/Change],*** driver converter of USB Bus will be uninstalled,
h/ after uninstallation reboot the computer.

6.3. EMERGENCY DRIVER UNINSTALLATION

If there are problems with correct operation of drivers or converter and or on the computer was installed driver other devices this type, it is possible to use the special software form delivered CD-ROM to clean the system form files and entries in the system registry. This can be done after uninstallation descried in point 6.1 and 6.2.

6.3.1. EMERGENCY DRIVER UNINSTALLATION IN WINDOWS 98/ME/2000

Emergency driver uninstallation in Windows 98/ME/2000 system have to be done according follow steps:

a/ disconnect converter from computer,

b/ from CD-ROM delivered with converter, copy to hard disk the folder ***Windows\Win-98ME_1.09.06\FTClean*** for Windows 98/ME or ***Windows\Win-2000\FTClean*** for Windows 2000,

c/ from FTClean folder run the application ***FTClean.exe*** and follow the Tooltip,

d/ after finishing, reboot the computer.

6.3.2. EMERGENCY DRIVER UNINSTALLATION IN WINDOWS XP/2003/Vista/7/2008

Emergency driver uninstallation in Windows XP/2003/Vista/7/2008 system have to be done according follow steps:

a/ disconnect converter from computer,

b/ login the ***Administrator account,***

c/ from CD-ROM delivered with converter, copy to hard disk the folder ***Windows\Win-XP-2003-Vista-7-2008_2.06\ CDMUninstaller***,

d/ from CDMUninstaller folder run the application ***uninstall.bat***,

e/ after finishing, reboot the computer.

7. USING

After proper connection according to section above the converter can be used. If connection of USB cable was made property green LED PWR on front panel of converter should light. If doesn't, check the connection of converter to the computer or computer is ON and or it isn't in hibernation mode.
During data transmission LEDs should blink and they indicate appropriately::

LED	*Description*
PWR	Signalling of Power Supply
RX	Signalling of data receiving through ADA-I9140 from RS485/422 port.
TX	Signalling of data transmitting from ADA-I9140 through RS485/22 port.
RTS	Signalling RTS line condition on RS485/RS422 port
CTS	Signalling of CTS line condition on RS485/RS422 port
DTR	Signalling of DTR line condition on RS485/RS422 port
DSR	Signalling of DSR line condition on RS485/RS422 port

7.1. BAUD RATE SELECTION FOR PROFIBUS COM PORT

For setting correct Profibus baud rate (after installation “Virtual Port” driver for Profibus) in application using virtual port COM follow table below.

Set baud rate [bps]	*Actual baud rate [bps] Profibus*
230400	**937500**
460800	**187500**
921600	**500000**
14400	**1500000**

7.2. SELECTION OF COM PORT LARGER THAN COM9

If virtual port COM of converter will install in Windows OS as COM10 or larger then in application using this port, should be typed COM port address as: \\.\COM10.

8. VERSIONS

ADA-I9140 - [ ] - [ ]

Signals:	
Tx, Rx	**1**
TX,RX, additionally DTR, DSR or RTS, CTS	**2**
Galvanic isolation:	
1kV=	**2**
3kV=	**3**

Order example:
Product symbol: **ADA-I9140-1-2**

1 – signals: Tx, Rx,

2 – galvanic isolation 1kV=.

9. SPECIFICATION

PARAMETERS		
	USB	**RS-485/RS-422**
Connector	USB cable with A-type connector	Screw terminal block, max. wire Ø 1mm^2
Line length	Up to 5m	1200 m (depend on baud rate)
Maximum number of connected devices	1	32
Transmission line	USB standard cable	Twisted cable 1-pair, 2- pair or 4-pair, UTP Cat.5e, shield inside large interferences STP Cat. 5e.
Standards	USB1.1, USB2.0	EIA-485, CCITT V.11,
Maximum baud rate	up to 921,6 kbps (Standard) / up to 1500 kbps (Profibus)	
Transmission type	Asynchronous, half duplex or full duplex,	
Optical Signalization	PWD – green LED (power supply) RX - red LED data reception on RS-485/RS-422 port, TX - yellow LED data transmission on RS-485/RS-422 port, RTS - yellow LED condition of RTS line, CTS - yellow LED condition of CTS line, DTR - yellow LED condition of DTR line, DSR - yellow LED condition of DSR line,	
Nominal work conditions		
Power requirements	from USB of Computer	
Power	< 1W	
Galvanic isolation	1kV= or 3kV= between signal line RS-485/RS-422 and USB	
Optoisolation	2,7kV= between signal line USB and RS-485/RS-422	
Operating temperature	0 ÷ +23 ÷ +50°C	
Humidity	5 ÷ 95% - non-condensing	
Location during work	Free	
Electromagnetic compatibility	Resistance to disruptions according to the standard PN-EN 55024. Emission of disruptions according to the standard PN-EN 55022.	
Safety requiring	According to the PN-EN60950 norm.	
Environment	Commercial and light industrial.	
Casing		
Dimensions (W x D x H)	92mm x 21mm x 57mm.	
Material	Polystyrene	
Degree of casing protection	IP30	
Weight	< 0,10 kg	
Conditions of storing and transportation		
Storage temperature	-20 ÷ 70°C	
Humidity	5 ÷ 95% - non-condensing	

Dear Customer,

Thank you for purchasing **CEL-MAR Company** product.
We hope that the **ADA-I9140 converter** and this user manual help simplify your network of 1-Wire sensor for industrial applications. We also wish to remind you that CEL-MAR Company are a manufacturer of the widest selections of data communications products in the world in applications such as: data transmission converters in RS232, RS485, RS422, USB, Current Loop, Fibre-Optic and Ethernet Converters and many others.
We welcome your feedback so please contact us to tell how you like our products and how we can satisfy you present and future needs.

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